

TOPIC 3 – PERIODICITY

3.1 – PERIODIC TABLE

IB Chemistry
T03D01



3.1 – Periodic Table – 1 hr

- 3.1.1 Describe the arrangement of elements in the periodic table in order of increasing atomic number. (2)
- 3.1.2 Distinguish between the terms group and period.(2)
- 3.1.3 Apply the relationship between the electron arrangement of elements and their position in the periodic table up to $Z = 20$. (2)
- 3.1.4 Apply the relationship between the number of electrons in the highest occupied energy level for an element and its position in the periodic table. (2)



3.1

Periodic Table

3.1.1 Describe the arrangement of elements in the periodic table in order of increasing atomic number. (2)

- The **Periodic Law** states that when the elements are arranged in order of **increasing atomic number**, there is a periodic repetition of their physical and chemical properties
- **Mendeleev** organized all of the elements into one comprehensive table.
 - Elements were arranged in order of increasing mass.
 - Once that was completed elements with similar properties were placed below each other in the same group



3.1

Groups vs Periods

3.1.2 Distinguish between the terms group and period.(2)

PERIODS -

SIMILARITIES: THE NUMBER OF OUTER ELECTRON SHELLS.

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds								

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

GROUPS –

SIMILARITIES: THE NUMBER OF ELECTRONS IN THE OUTER SHELL.
COMMON REACTIVITY, BONDING, CHEMICAL AND PHYSICAL PROPERTIES.

H	
Li	Be
Na	Mg
K	Ca
Rb	Sr
Cs	Ba
Fr	Ra

B	C	N	O	F	Ne
Al	Si	P	S	Cl	Ar
Ga	Ge	As	Se	Br	Kr
In	Sn	Sb	Te	I	Xe
Tl	Pb	Bi	Po	At	Rn

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Alkali Metals Metalloids Non-metals Halogens

Alkaline Earths Weak/Poor Metals

Transition Metals

H	He
Li	Be
Na	Mg
K	Ca
Rb	Sr
Cs	Ba
Fr	Ra

Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	B	C	N	O	F	Ne
Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	Al	Si	P	S	Cl	Ar
La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Ga	Ge	As	Se	Br	Kr
Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds			In	Sn	Sb	Te	I	Xe
										Tl	Pb	Bi	Po	At	Rn

Lanthanides

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Actinides

Noble Gases



3.1 Electron Arrangement vs Position

3.1.3 Apply the relationship between the electron arrangement of elements and their position in the periodic table up to $Z = 20$.

1	
2.1	2.2
2.8.1	2.8.2
2.8.8.1	2.8.8.2

					2
2.3	2.4	2.5	2.6	2.7	2.8
2.8.3	2.8.4	2.8.5	2.8.6	2.8.7	2.8.8

- The electron arrangement repeats, just as the valence electron's do.
- Once you pass 20 and get into the d-block and f-block electrons, the trend still continues but it makes more sense when represented in the electron configurations of $1s^2 2s^2 2p^6$, etc



3.1.4 Apply the relationship between the number of electrons in the highest occupied energy level for an element and its position in the periodic table. (2)

- In reference to the previous slide
 - Valence electrons repeat along with the group
 - It can be demonstrated much easier (past 20) when in the electron configuration

